

# 11.0 Collection and handling of LCD screens



## Contents

- |      |   |
|------|---|
| 11.1 | Health and Safety and Environmental Procedures for LCD screens                              |
| 11.2 | Traceability and Management Systems   |
| 11.3 | Communication within the supply chain   |
| 11.4 | Collection of LCD screens   |
|      | <b>11.4.1 Handling LCD screens</b>  |
|      | <b>11.4.2 Packaging and packing options for Business Users and Retailers</b>                |
|      | <b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b> |
|      | <b>11.4.4 Safe handling equipment</b>   |
| 11.5 | Re-use and treatment of LCD screens   |
|      | <b>11.5.1 LCD screens going for re-use</b>  |
|      | <b>11.5.2 LCD screens going for treatment</b>   |

**Summary:** Good practice guidance for the supply chain relating to the safe handling of LCD screens.

**Audience:** This section will be of interest to all those involved in the dispatch, storage, collection, handling and transportation of LCD screens (whether destined for re-use or recycling facilities). They will be able to understand the issues that may affect them and their staff or clients and the environment.

**Benefits:** The guide will ensure safe and appropriate handling of LCD screens that use mercury containing backlight technology.

## 11.1 Health and Safety and Environmental Procedures for LCD screens

WRAP have published two research reports on LCD screens containing mercury. The first report explores the possibilities of [recycling and recovering materials from the screens](#) and considers four types of equipment containing LCD screens:

- televisions;
- desktop monitors;
- laptop computers; and
- plasma screen televisions.

The second report delivers a summary of [mercury waste in LCD backlights found in LCD televisions and monitors](#). The executive summary of this report highlights mercury as being hazardous to health.

Producer Compliance Schemes, local authorities and other organisations who contract work to hauliers, AATF and third sector partners should request details of how they handle the WEEE on their behalf to ensure they have safe operating procedures in place for the individual or bulk handling of LCD screens.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

The [Health and Safety Executive website](#) notes that LCD screens contain mercury within the CCFL backlights. Mercury is a heavy metal and its properties are a health concern to humans as it has toxic properties. When a lamp (contained within the LCD screen unit) is damaged it is possible for direct exposure to mercury vapour and mercury dust, which poses a high risk. The metal can vaporise at room temperature and employees who come into contact routinely are not always aware of the risks. It is easily absorbed through the lungs and can lead to severe respiratory tract damage with the symptoms of shortness of breath, muscle weakness, headache and fever. Ingestion can cause burning of the mouth, abdominal pain, vomiting and bloody diarrhoea. Skin contact with mercury may cause irritation and burning with symptoms of redness and pain. Contact with mercury may also result in skin sensitisation. Mercury eye contact may cause symptoms of redness, pain, blurred vision and in some cases permanent eye damage. It is for this reason that LCD screens have been classed as hazardous waste and why the Environment Agency (EA) has issued a regulatory statement setting out the [storage and treatment requirements](#) for these appliances. LCD screens must be treated by licensed operators who have adequate mercury abatement systems in place which are inspected and regulated by the EA or the Scottish environmental protection agency (SEPA) or Northern Ireland Environment Agency (NIEA).

### Health and Safety

Airborne exposure can be considerably reduced by storing the LCD screens in areas with good ventilation and by preventing damage during handling and transportation including dropping screens into bulking up containers, compacting or tipping.

Damaged units (where the lamps are broken) should be kept in a well-ventilated area and any dust or vapour allowed to settle before containing in a sealed bag or box. Cleaning should be carried out using an appropriate industrial vacuum designed specifically for cleaning mercury contamination.

The Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended) imposes duties on employers to assess the risks to health arising from exposure to hazardous substances and to ensure that exposure to these substances is prevented or, where this is not reasonably practicable, adequately controlled.

Personal protective equipment (PPE) should be used by all those involved the collection, transportation, handling, storage, re-use, recycling and treatment. This may include face masks and other breathing apparatus depending on the operation being carried out.

All stakeholders that handle LCD screens need to demonstrate that they have [safe operating procedures](#) in place for the individual or bulk handling of LCD screens. This may include assessment of the physical lay-out of the collection site and the provision of warnings, instructions, procedures and notices.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

The Health and Safety Executive (HSE) discusses [health surveillance of employees exposed to mercury](#). The HSE have also provided information on lamp/tube recycling as part of their guidance on [WEEE recycling](#) which can be found detailed in [Appendix 3](#) of the main HSE WEEE guidance.

Designated Collection Facility (DCF) operators need to provide suitable containment for LCD screens and advice on how the public should be protected from other users and vehicles or plant on site. The HSE provide guidance for [storing hazardous wastes at household waste recycling centres \(HWRC\)](#) on their website.



### ILM Highland: Good practice at a Designated Collection Facility

An example of good practice seen at a DCF is provided by ILM Highland, an ISO 9001 accredited independent social enterprise with charity status located in Alness Scotland, who collect waste LCD screens from household waste recycling centres (HWRCs) across the Highlands of Scotland.

ILM Highland provide small pallet cages for members of the public to deposit the screens into. The stillages are shallow enough that screens do not need to be thrown into them. TVs and monitors containing cathode ray tubes (CRTs) are kept separate from LCD screens to increase the re-use possibilities and increase the numbers of flat screens per cage.

Training is provided to HWRC staff to enable them to advise the public on how best to handle and place the items (screens all face up) to prevent damage.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
11.4.1	Handling LCD screens
11.4.2	Packaging and packing options for Business Users and Retailers
11.4.3	Containers for bulk collections at DCFs and other Waste Management Facilities
11.4.4	Safe handling equipment
11.5	Re-use and treatment of LCD screens
11.5.1	LCD screens going for re-use
11.5.2	LCD screens going for treatment

Retailers of electrical and electronic equipment need to be aware of the issues arising from handling broken or cracked LCD screens and the need to provide suitable storage for screens being returned by the public for re-use and recycling.

#### **Good practice**

Provide a four sided wire cage for staff use that has wheels attached for mobility. Larger screens should be placed at the bottom of the cage (or on its own) to ensure that the cage is not top heavy to prevent it from tipping.

If the LCD screens are not returned to the store in their original packaging, they should be protected by wrapping them in cardboard, and taping the edges to prevent movement.

Once loaded, the cage should be wrapped in shrink wrap to protect the contents from the elements while loading and unloading and to secure the sides during transit.

#### **Training**

Training should be provided to all staff to ensure the correct use of tools and other equipment for packaging and storing LCD screens, as well as lifting and transporting packed screens to the re-use or treatment facility.

Training should also be provided to raise staff awareness of the human health and safety hazards associated with handling LCD screens. This should include emergency procedures should the units become damaged and the back-lamps cracked or broken. Employers should also conduct research to establish if they need to implement health screening for employees who handle or treat LCD screens.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

## 11.2 Traceability and Management Systems

Due to the hazardous nature of mercury it is good practice to ensure that robust management systems are implemented for LCD screens. All waste LCD screens leaving any site must be consigned as hazardous waste and records should be kept for a minimum of four years.

Records of where redundant or returned LCD screens that are suitable for re-use (i.e. not waste) are sent should be kept. Procedures also need to be put in place to ensure the downstream chain is verified to prevent the use of sham re-use operators. Checks should include where the units will be tested (especially if they are to be exported after testing), procedures to be used and confirmation that the capacity of the re-use operator accords with the volume of units being received.

### Good practice

Select a re-use operator, based in the UK, that has been certified or accredited to the PAS141 re-use standard. A set of [re-use protocols for electrical products](#) are available to support compliance with PAS141.

All stakeholders need to ensure that appropriate levels of Duty of Care checks are carried out on their contractors and sub-contractors who handle LCD screens. The checks should include viewing waste carriers and environmental permits for validity, checking driver documentation and ensuring they comply with health, safety and environmental regulations.

Hauliers are required to hold a waste carriers permit and have a responsibility to ensure that hazardous waste consignment notes are completed.

[Duty of care waste transfer notes](#) are available on the EA website and need to record the dispatch and onward route data that demonstrates where LCD screens are being sent for re-use or recycling, including the details of the licensed waste carrier and their final treatment destination.

In England and Wales hazardous waste producers who dispatch more than 500kg of hazardous waste (of any type / mixed types) from their premises in a 12 month period, have an obligation to register the site with the Environment Agency. A site producing less than 500kg in any 12 month period will need to be recorded on the Duty of Care paperwork as an exempt site. Information on whether you need to register can be found on the [EA website](#). Re-use and treatment operators must ensure that they record the address from where the waste was dispatched. In England and Wales there is a further requirement for the appropriate hazardous waste premises code or exemption code to be recorded by the site receiving the waste.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens <ul style="list-style-type: none"> <li><b>11.4.1 Handling LCD screens</b></li> <li><b>11.4.2 Packaging and packing options for Business Users and Retailers</b></li> <li><b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b></li> <li><b>11.4.4 Safe handling equipment</b></li> </ul>
11.5	Re-use and treatment of LCD screens <ul style="list-style-type: none"> <li><b>11.5.1 LCD screens going for re-use</b></li> <li><b>11.5.2 LCD screens going for treatment</b></li> </ul>

Exporters of LCD screens need to ensure a full, auditable duty of care process is in place for WEEE and REEE being exported from the UK. If WEEE evidence needs to be provided to the [UK Settlement Centre](#), then the export must be made via an 'Approved Exporter'. This permit is required annually (January to December) and covers pre-notified overseas sites which have been accepted by the environmental agencies as having the necessary licenses, authorisations and monitoring controls in place to carry out the re-use or treatment to equivalent standards as found in the United Kingdom. Details of how to apply for an [approved exporter permit](#) can be found on the EA website.

Importing or exporting waste to or from the United Kingdom is subject to strict regulatory controls under the [Trans-frontier Shipment of Waste Regulations 2007](#), the EA provides information, advice and guidance on [international waste shipments](#) on their website.

Retailers of electrical and electronic equipment need to be aware that they have a requirement under the WEEE Regulations to display information relating to in-store take back of end of life appliances including LCD screens. WRAP have developed a [free WEEE retailer toolkit](#) of resources to help retailers meet this requirement.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

### 11.3 Communication within the supply chain

It is important to raise awareness of the issues relating to LCD screens, such as manual handling and mercury content, up and down the supply chain.

Due to the hazardous nature of LCD screens all hauliers need to establish the requirements of the collection site client before collecting and transporting LCD screens. This may include the provision of, and responsibility for, packaging and bulking-up containers.

Producers, importers and retailers should be aware of the importance of designing their products to benefit the environment and the health and safety of their staff and members of the public. This can be used in positive marketing initiatives to consumers. The subject areas should include design for the environment, design for repair and design for recycling. WRAP have developed [guidance and case studies](#) on electronic product design, including the use of recycled materials.

Producers and retailers should produce and make available documentation detailing the content of their products, including the location and volume of hazardous components. This information may help promote recovery of minerals and elements used in the manufacturing process.

For business users, there may be arrangements in place with the [producer](#) – e.g. the importer, re-branding or manufacturer of electrical and electronic equipment, to collect and recycle redundant or waste LCD screens when new equipment is purchased or the appliance reaches its end of life. Producers and retailers should ensure that their contractual and marketing information includes clear details about how WEEE should be returned or alternative options that may be offered.

Stakeholders should think about the possibilities of re-using LCD screens either in house or via an approved re-use facility rather than recycling. Third sector organisations offer excellent opportunities for re-use as these often provide added social benefit as an output of their re-use processes. Commercial re-use organisations may offer reimbursements or other incentives against certain equipment. It is therefore good practice for producers, importers and retailers to give re-use organisations access to spare parts and technical manuals so as to help promote the re-use process.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>



## Good practice collections from business sites

Good examples can be found where third sector organisations employ disadvantaged adults and train them back to employment by refurbishing appliances. Refurbished appliances are sold on to low income families in the community who would not otherwise have access to luxury consumer goods and information technology.

Working with their local business community, donations from organisations who wish to dispose of their redundant IT equipment can be quickly dismantled and labelled ready for transportation back to their workshops. The stands are removed from the LCD screens and they carefully pack the monitors into robust cardboard packaging. The peripherals are then separately packaged to allow for safe transportation back to base.

Once back at the workshop the base units, keyboard, mouse and original cables are reunited with the LCD screen, before progressing through the required data wiping and quality checks.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

## 11.4 Collection of LCD screens

It is good practice for LCD screens to be separated from other display equipment as they will be treated by a different process.

Although the outer casings of LCD screens are robust, there exists a danger of **mercury contamination** due to the delicate construction of the CCFLs used to backlight the viewing screens. It is for this reason that LCD screens need to be prepared carefully for transportation. This preparation is important so as to protect people and the environment from unwanted hazardous exposure to the heavy metal mercury. For re-use this is especially important as even slight damage may make the LCD unit undesirable and make it hard, or even impossible to retail via a re-use outlet.

It is good practice for waste collection and disposal authorities to encourage all their contractors to assist them in raising awareness of the health and safety issues surrounding LCD screens, relating to accidental release of mercury from cracked cases or broken screens. This activity should be integrated into the tendering process for new contractors. Robust communication in this area is likely to minimise waste and promote re-use. Options for re-use within a waste or disposal authority area should be made available to the public – via signage at the collection sites on a website or other promotional activity.

DCF operators should provide advice to the public relating to LCD screens, raising awareness of the need to handle them carefully so as to prevent the accidental escape of mercury. Signage at collection sites should include information on handling methods, and adequate assistance and the correct containers provided (at ground floor level) to prevent throwing of units into containers.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

### 11.4.1 Handling LCD screens

The following are good practice procedures to consider adopting when handling LCD screens:

- As units differ in size and weight, assistance should be sought prior to attempting to move any screen over 28" as the sheer dimensions will increase the risk of serious injury. It is difficult to define a general / average weight of a LCD screen, which is why it is so important to gauge the unit prior to lifting.
- It is important that the glass screen is held towards the body and not facing externally – to prevent accidental damage should you collide with something.
- Should the screen fall the release of mercury from the lamps within the screen are potentially harmful – the area should be evacuated if this was to occur, and specialist PPE and cleaning equipment used to capture the mercury dust.

Best practice would suggest that a screen is to be moved / lifted via the handgrips supplied on the unit. Where this is not possible the best technique to use is to place one hand under the left hand side of the unit and one hand on top of the right hand side of the unit.

#### Never struggle – always stop and seek assistance first

- The most important aspect to remember is to ensure that you are working within your own capabilities. Due to different types of item, weight, size and bulkiness of them will differ, so it is important that you adapt your working practices when handling each specific item.
- Units should face glass to glass with a protective covering between them e.g. thick cardboard.
- Ensure you distribute the weight of the load in the stillage evenly to avoid problems when using the pallet truck and vehicle loading.
- Containers should be loaded in an organised fashion where plausible i.e. larger units at the bottom, smaller units at the top – with the screens all facing the same way. The idea is to ensure that the items are loaded in such a way as to reduce the risk of injury at the unloading point and to also maximise the efficiency of the container.
- If pallets are used, the height should not be that great so as to pose a risk of toppling over – especially during transit or loading / unloading.
- Shrink wrapped pallets should have the shrink wrap at each separate level. Ensure the bottom level is shrink wrapped to the pallet base for greater stability.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

### 11.4.2 Packaging and packing options for Business Users and Retailers

Robust packaging placed around the LCD screens will prevent potential damage during transit.

If the original packaging is unavailable, look for suitable alternatives such as cardboard boxes, individual cardboard sheets, bubble wrap or polystyrene blocks.

License plates / plugs and cables (and remote controls or other accessories if available) must be taped to the back of the LCD screen (and not the front) to prevent scratches.

If the screen is very large, plastic wrapping (such as a heavy duty bin liner with bubble wrap on the inside layer) should be placed over the unit and securely taped.

LCD screens protected in a packaging box may be subject to shock when the box is bumped against a hard surface or falls to the floor accidentally. Where re-use is the selected route, it is essential therefore that the packaging should be sufficient to not only protect the unit itself, but also from the shock pulse transmitted to the fragile lamps inside the appliance.

#### RD Trading Limited: Bespoke packaging design for notebooks and LCD screens

RD Trading Limited, **trading as RDC** is based in Braintree in Essex. Formed in 1991, they redeploy, remarket and recycle IT equipment. They have developed bespoke packaging designed specifically for the transportation of notebooks and LCD screens.

Each unit slots into its own cardboard partition. On average, RDC can slot between 15–20 LCD screens per slot box. The cardboard is made from 100% recycled materials and the box is designed to protect the unit during storage and handling. The design has significantly reduced the packaging required – bringing associated cost and environmental benefits.

The slot boxes fit on top of a four-way entry flat wood pallet of 1200 x 1000 mm dimension and so can be stored on pallets in pallet racking, reducing expensive storage space requirements. Corner supports can be added to enable one box to be stored on top of another.



11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

## BTR UK: Using existing product packaging

BTR UK provides a range of professional services to corporate and government organisations disposing of their redundant IT equipment.

If new equipment is being installed, the BTR engineers will re-use the packaging from these appliances to package the old equipment or packaging will be sent to a client (who will then pack their redundant equipment using BTR instructions).

The instructions include the need to stack all screens face down, using foam / screen protectors provided, and where possible, removing stands, making sure that they and any screws and fastenings are kept safe and not discarded. If this is not possible, the stands should be situated on the outside of each stack to prevent accidental damage to the screens and to secure shrink wrap to help prevent movement during transit.

Containers with display equipment (televisions or monitors containing CRTs and / or LCD screens etc.) MUST NOT be compacted at any point as this can release harmful mercury and lead dust into the atmosphere.

### 11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities

Research by the [European Electronics Recyclers Association \(EERA\)](#) in 2010 showed that up to 20% of lamps within LCD screens are damaged if dropped into containers from heights over 2.5m. The use of containers on split level sites should therefore be avoided.

Ideally low level stillages or containers should be provided, with separate provision for units containing cathode ray tubes to that provided for LCD screens as these will require different handling and treatment at the AATFs. LCD screens can also be flat loaded on to a pallet, with the screens facing downwards and any screen stands situated on the outside (to help build up an outer edge when the loaded pallet is shrink wrapped).

A new container has been designed and introduced in Italy (TRED Carpi S.r.l) in order to optimise the reverse logistics system by making all the activities related to the transportation and handling of WEEE less time-consuming, less risky for operators and more efficient. It has an open top end that makes it suitable for transporting over height loads.

It has two folding side walls capable of swinging more than 180° in order to ease loading / unloading activities and reduce the risk of work related injuries for operators.

It is provided with simple to use locking devices for attaching the adjacent side walls to each other when the container is in an erected state. Members of the public / site operatives can safely walk on the sides when down to access the loading area.

### 11.4.4 Safe handling equipment

Manual handling equipment should always be used to move the LCD screens once they are packed, due to weight and the associated health and safety implications.

Typical methods used included sack trolleys, pump trucks; the use of electric tail lifts and fork lift trucks.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

## 11.5 Re-use and treatment of LCD screens

### 11.5.1 LCD screens going for re-use

It is considered good practice for an operator to have repaired and refurbished appliances in the UK to a quality re-use standard such as **PAS141** demonstrating that there is an auditable trail of documentation for each appliance and showing the qualifications and training undertaken by the re-use operatives carrying out the work.

The aim of PAS141 is to increase the re-use of WEEE in accordance with the objectives of the WEEE Directive, and assure consumers that used electrical and electronic equipment (UEEE) has been tested and prepared for re-use – safe to use, functional, free of protected data and backed by a warranty. Consumers and users of re-used equipment in the public and private sectors can look for PAS141 certification reassurance which is perceived as being no different to any other form of kite mark seen today. The PAS141 is also seen to be a mechanism to encourage re-use and refurbishment job creation in the UK in both the commercial and third sector and help reduce WEEE to landfill.

Re-use operations for LCD screens should include visual, electrical safety and functionality tests as a minimum. If a repair is required, only OEM replacement components, OEM approved pattern components, reclaimed identical components or aftermarket genuine parts appropriate for the intended use should be used. The appliance should be offered with a warranty in case of damage/non-function etc.

Re-use facilities therefore need to ensure that they have the skills and training in place to ensure the safe handling, testing and repair of LCD screens as well as the necessary permits to allow them to accept WEEE (if appropriate) at their facility along with the validated downstream disposal routes for any appliances or components deemed not suitable or fit for re-use.

Operators exporting LCD screens that are destined for re-use overseas need to ensure that it has been tested in the UK prior to export to be sure that the appliance is capable of being re-used (after repair or refurbishment), rather than they think it may be suitable.

11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

### 11.5.2 LCD screens going for treatment

Treatment facilities should ensure that the skills and technology are in place before LCD screens are accepted onsite for treatment and that there are adequate amounts of safe secure storage.

**WRAP research** estimates that the total waste arising from LCD display products containing CCFLs will be:

Year	2013	2014	2015	2016	2017
Tonnes	70,000	100,00	115,000	120,000	115,000

The study concluded that an automated shredding process would require that suitable mercury abatement systems are in place to prevent mercury from becoming airborne in the wider environment. Without suitable processes to isolate the mercury after shredding, the resulting materials would be classed as hazardous, and thus rendered unsuitable for other recycling and re-use processes.

Following this work, the Environment Agency have issued a **Regulatory Position Statement (September 2011)** on the treatment of LCD units in relation to the compliance with the Best Available Treatment Recovery and Recycling Techniques (BATRRRT) as detailed by **Defra BATRRRT Guidance** published in 2006. This concludes that unless treatment operators can demonstrate that a mechanical operation is able to remove and capture the mercury in a manner that protects human health and the environment, that it is likely that only manual treatment of LCD screens will be acceptable. Operators who continue to mechanically treat LCD screens without being able to demonstrate their system is compliant after the 1st June 2012 may be subject to enforcement action.

While steps have been taken to ensure its accuracy, WRAP cannot accept responsibility or be held liable to any person for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading. This material is copyrighted. It may be reproduced free of charge subject to the material being accurate and not used in a misleading context. The source of the material must be identified and the copyright status acknowledged. This material must not be used to endorse or used to suggest WRAP's endorsement of a commercial product or service. For more detail, please refer to our Terms & Conditions on our website – [www.wrap.org.uk](http://www.wrap.org.uk)

#### Waste & Resources Action Programme

The Old Academy,  
21 Horse Fair,  
Banbury, Oxon  
OX16 0AH

Tel: 01295 819 900

Fax: 01295 819 911

E-mail: [info@wrap.org.uk](mailto:info@wrap.org.uk)

Helpline freephone

0808 100 2040

[www.wrap.org.uk/WEEEGuidance](http://www.wrap.org.uk/WEEEGuidance)



11.1	Health and Safety and Environmental Procedures for LCD screens
11.2	Traceability and Management Systems
11.3	Communication within the supply chain
11.4	Collection of LCD screens
	<b>11.4.1 Handling LCD screens</b>
	<b>11.4.2 Packaging and packing options for Business Users and Retailers</b>
	<b>11.4.3 Containers for bulk collections at DCFs and other Waste Management Facilities</b>
	<b>11.4.4 Safe handling equipment</b>
11.5	Re-use and treatment of LCD screens
	<b>11.5.1 LCD screens going for re-use</b>
	<b>11.5.2 LCD screens going for treatment</b>

